

## CONTENTS

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<b>EAORC NOTICES.....</b>	<b>2</b>
PUBLICATION ALERTS.....	2
ACADEMIA.EDU – Pointing: Where Embodied Cognition Meets the Symbolic Mind.....	2
<a href="#">MASSIMILIANO L. CAPPUCCIO (ed.) – Pointing: Where Embodied Cognition Meets The Symbolic Mind.....</a>	<a href="#">2</a>
ACADEMIA.EDU – Reconsidering the Role of Manual Imitation in Language Evolution.....	2
<a href="#">ANTONELLA TRAMACERE &amp; RICHARD MOORE – Reconsidering the Role of Manual Imitation in Language Evolution.....</a>	<a href="#">2</a>
ACADEMIA.EDU – First communions: Mimetic sharing without theory of mind.....	3
<a href="#">DANIEL D. HUTTO – First communions: Mimetic sharing without theory of mind.....</a>	<a href="#">3</a>
<b>NEWS.....</b>	<b>3</b>
BREAKING SCIENCE – 4-Months-Old Ravens Parallel Great Apes in Cognitive Skills, Study Shows.....	3
BREAKING SCIENCE – Kangaroos Can Intentionally Communicate with Humans.....	3
SAPIENS – The archaeology of sound tools.....	3
SCIAM NEWS – Young Ravens Rival Adult Chimps in a Big Test of General Intelligence.....	3
SCIAM NEWS – Bird Brains Are Far More Humanlike Than Once Thought.....	3
SCIAM NEWS – Conservative and Liberal Brains Might Have Some Real Differences.....	3
SCIENCE DAILY – The DNA regions in our brain that contribute to make us human.....	4
SCIENCE DAILY – What's up, Skip? Kangaroos really can 'talk' to us, study finds.....	4
SCIENCE DAILY – Monkeys, like humans, persist at tasks they've already invested in.....	4
SOCIETY FOR SCIENCE – Bonobos, much like humans, show commitment to completing a joint task.....	4
<b>PUBLICATIONS.....</b>	<b>4</b>
American Journal of Physical Anthropology.....	4
<b>PAPERS.....</b>	<b>4</b>
<a href="#">JULIET K. BROPHY et al – Comparative morphometric analyses of the deciduous molars of Homo naledi from the Dinaledi Chamber, South Africa.....</a>	<a href="#">4</a>
Biology Letters.....	4
<b>PAPERS.....</b>	<b>4</b>
<a href="#">ALAN G. MCELLIGOTT, KRISTINE H. O'KEEFFE &amp; ALEXANDRA C. GREEN – Kangaroos display gazing and gaze alternations during an unsolvable problem task.....</a>	<a href="#">4</a>
Evolutionary Anthropology.....	5
<b>ARTICLES.....</b>	<b>5</b>
<a href="#">BERNARD WOOD – Birth of Homo erectus.....</a>	<a href="#">5</a>
<b>PAPERS.....</b>	<b>5</b>
<a href="#">MICHELLE C. LANGLEY &amp; THOMAS SUDDENDORF – Mobile containers in human cognitive evolution studies: Understudied and underrepresented.....</a>	<a href="#">5</a>
<a href="#">METIN I. EREN, STEPHEN J. LYCETT &amp; MASAKI TOMONAGA – Underestimating Kanzi? Exploring Kanzi-Oldowan comparisons in light of recent human stone tool replication.....</a>	<a href="#">5</a>
<a href="#">ABIGAIL E. PAGE &amp; JENNIFER C. FRENCH – Reconstructing prehistoric demography: What role for extant hunter-gatherers?.....</a>	<a href="#">5</a>
Nature.....	6
<b>PAPERS.....</b>	<b>6</b>
<a href="#">ALAN S. COWEN et al – Sixteen facial expressions occur in similar contexts worldwide.....</a>	<a href="#">6</a>
<a href="#">SÉBASTIEN BALLESTA et al – Values encoded in orbitofrontal cortex are causally related to economic choices.....</a>	<a href="#">6</a>
Nature Communications.....	6
<b>PAPERS.....</b>	<b>6</b>
<a href="#">R. NATHAN SPRENG et al with ROBIN I. M. DUNBAR – The default network of the human brain is associated with perceived social isolation.....</a>	<a href="#">6</a>
Nature Human Behaviour.....	6
<b>PAPERS.....</b>	<b>6</b>
<a href="#">BETHANY BURUM, MARTIN A. NOWAK &amp; MOSHE HOFFMAN – An evolutionary explanation for ineffective altruism.....</a>	<a href="#">6</a>
Nature Scientific Reports.....	7
<b>PAPERS.....</b>	<b>7</b>
<a href="#">AURÉLIEN MOUNIER et al – Gravettian cranial morphology and human group affinities during the European Upper Palaeolithic.....</a>	<a href="#">7</a>
<a href="#">SIMONE PIKA et al – Ravens parallel great apes in physical and social cognitive skills.....</a>	<a href="#">7</a>
<a href="#">EVY VAN BERLO et al – Experimental evidence for yawn contagion in orangutans (Pongo pygmaeus).....</a>	<a href="#">7</a>

Philosophical Transactions of the Royal Society B .....	7
<b>PAPERS</b> .....	7
FLAVIE WATERS, JOSEPH M. BARNBY & JAN DIRK BLOM – Hallucination, imagery, dreaming: reassembling stimulus-independent perceptions based on Edmund Parish's classic misperception framework .....	7
ROGER KOENIG-ROBERT & JOEL PEARSON – Why do imagery and perception look and feel so different?.....	8
BENCE NANAY – Unconscious mental imagery .....	8
PLoS Biology.....	8
<b>PAPERS</b> .....	8
ANIS NAJAR et al – The actions of others act as a pseudo-reward to drive imitation in the context of social reinforcement learning .....	8
PLoS One.....	8
<b>PAPERS</b> .....	8
TABEA MEIER et al with JAMES W. PENNEBAKER – Stereotyping in the digital age: Male language is “ingenious”, female language is “beautiful” – and popular .....	8
PNAS .....	9
<b>PAPERS</b> .....	9
SEOUNG-MOK YUM et al – Fingerprint ridges allow primates to regulate grip.....	9
Trends in Cognitive Sciences .....	9
<b>PAPERS</b> .....	9
DAVID PITCHER & LESLIE G. UNGERLEIDER – Evidence for a Third Visual Pathway Specialized for Social Perception .....	9
MEDHA SHEKHAR & DOBROMIR RAHNEV – Sources of Metacognitive Inefficiency .....	9
BRUCE RAWLINGS & CRISTINE H. LEGARE – Toddlers, Tools, and Tech: The Cognitive Ontogenesis of Innovation.....	9
ASIFA MAJID – Human Olfaction at the Intersection of Language, Culture, and Biology .....	10
ALAN S. COWEN & DACHER KELTNER – Semantic Space Theory: A Computational Approach to Emotion .....	10
<b>SUBSCRIBE to the EAORC Bulletin .....</b>	<b>10</b>
<b>UNSUBSCRIBE from the EAORC Bulletin .....</b>	<b>10</b>
<b>PRODUCED BY AND FOR THE EAORC EMAIL GROUP.....</b>	<b>10</b>

## EAORC NOTICES

### PUBLICATION ALERTS

If you have had a paper or book published, or you see something which would be of interest to the group, do please send me a publication alert so that I can include it in the newsletter. Many thanks to those who have already sent in alerts. If there is a journal you feel I should be tracking on a regular basis, do let me know. And if you have any other ideas for extending the “EAORC experience”, please contact me.

### ACADEMIA.EDU – Pointing: Where Embodied Cognition Meets the Symbolic Mind

*Humana Mente 24, July 2013.*

#### MASSIMILIANO L. CAPPUCCIO (ed.) – Pointing: Where Embodied Cognition Meets The Symbolic Mind

This special issue ... brings together in one volume an incendiary mix of the emerging generation of philosophers and language researchers, who bring their diverse perspectives to moor on one of the most fascinating phenomena in human development: the ability to co-orient in both space and time to a common focus with what seems, on the face of it, to be a simple pointing gesture. The emerging significance of research and analysis pertaining to pointing reflects a recent phase shift in the sciences concerned with mind and behaviour. To put these innovations in context, it might be worthwhile to review the sweeping upheavals that have recently occurred in the conceptual bedrocks of psychology and the philosophy of language.

[https://www.academia.edu/9621576/Humanamente\\_24\\_Pointing\\_Where\\_embodied\\_cognition\\_meets\\_the\\_symbolic\\_mind](https://www.academia.edu/9621576/Humanamente_24_Pointing_Where_embodied_cognition_meets_the_symbolic_mind)

### ACADEMIA.EDU – Reconsidering the Role of Manual Imitation in Language Evolution

*Topoi 37, 319-328 (2018).*

#### ANTONELLA TRAMACERE & RICHARD MOORE – Reconsidering the Role of Manual Imitation in Language Evolution

In this paper, we distinguish between a number of different phenomena that have been called imitation, and identify one form—a high fidelity mechanism for social learning—considered to be crucial for the development of language. Subsequently, we consider a common claim in the language evolution literature, which is that prior to the emergence of vocal language our ancestors communicated using a sophisticated gestural protolanguage (the ‘gesture-first view’), the learning of some parts of which required manual imitation. Drawing upon evidence from recent work in neuroscience, primatology, and archeology, we argue that while gestural communication undoubtedly played a crucial role in language evolution, the grounds for thinking that manual imitation did are currently unconvincing.

[https://www.academia.edu/30058734/Reconsidering\\_the\\_Role\\_of\\_Manual\\_Imitation\\_in\\_Language\\_Evolution?email\\_work\\_card=view-paper](https://www.academia.edu/30058734/Reconsidering_the_Role_of_Manual_Imitation_in_Language_Evolution?email_work_card=view-paper)

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## ACADEMIA.EDU – First communions: Mimetic sharing without theory of mind

*In Jordan Zlatev, Timothy P. Racine, Chris Sinha and Esa Itkonen (eds.), The Shared Mind: Perspectives on intersubjectivity. John Benjamins: Amsterdam, Netherlands (2008).*

### DANIEL D. HUTTO – First communions: Mimetic sharing without theory of mind

It is widely held that the gradual development of metarepresentational Theory of Mind (ToM) abilities constituted at least one important hominid upgrade. Are such abilities really needed to explain hominid (i) tool-making, (ii) social cohesion, or even (iii) basic interpretative and language formation/learning capabilities? I propose an alternative explanation of what underlies these sophisticated capacities – the Mimetic Ability Hypothesis (MAH). MAH claims that a vastly increased capacity for recreative imagination best explains the kinds of sophisticated intersubjective engagements of which hominids would have been capable – and that these constituted an important basis for the development of complex language. This proposal puts the idea of the evolution of ToM devices under considerable strain.

[https://www.academia.edu/347253/First\\_Communions\\_Mimetic\\_Sharing\\_without\\_Theory\\_of\\_Mind?email\\_work\\_card=view-paper](https://www.academia.edu/347253/First_Communions_Mimetic_Sharing_without_Theory_of_Mind?email_work_card=view-paper)

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## NEWS

### BREAKING SCIENCE – 4-Months-Old Ravens Parallel Great Apes in Cognitive Skills, Study Shows

By 4 months of age, the cognitive performance of common ravens (*Corvus corax*) in experimental tasks is similar to those of two great ape species, chimpanzees (*Pan troglodytes*) and orangutans (*Pongo pygmaeus*). “Human children show unique cognitive skills for dealing with the social world but their cognitive performance is paralleled by great apes in many tasks dealing with the physical world,” said lead author Dr. Simone Pika, a researcher at the University of Osnabrück and the Max Planck Institute for Ornithology, and colleagues.

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/R7Oz2X205Bk/ravens-great-apes-cognitive-skills-09152.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/R7Oz2X205Bk/ravens-great-apes-cognitive-skills-09152.html?utm_source=feedburner&utm_medium=email)

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### BREAKING SCIENCE – Kangaroos Can Intentionally Communicate with Humans

Kangaroos, marsupial mammals that have never been domesticated, can intentionally communicate with humans, according to new research led by the University of Roehampton. “Domestication is generally assumed to have resulted in enhanced communication abilities between non-primate mammals and humans, although the number of species studied is very limited (cats, dogs, wolves, goats, and horses),” said [...]

[http://feedproxy.google.com/~r/BreakingScienceNews/~3/1NGDdpFF760/kangaroos-intentionally-communicate-humans-09163.html?utm\\_source=feedburner&utm\\_medium=email](http://feedproxy.google.com/~r/BreakingScienceNews/~3/1NGDdpFF760/kangaroos-intentionally-communicate-humans-09163.html?utm_source=feedburner&utm_medium=email)

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### SAPIENS – The archaeology of sound tools

A team of archaeologists is working to uncover whether ancient objects in South Africa were once used as sound tools to make noise or music.

<https://sapiens.us11.list-manage.com/track/click?u=80f6cf678900daf984bf763b7&id=805f1941f6&e=dc0eff6180>

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### SCIAM NEWS – Young Ravens Rival Adult Chimps in a Big Test of General Intelligence

At just four months of age, the birds performed equally well as great apes on understanding numbers, following cues and many more tasks

<http://links.email.scientificamerican.com/els/v1/~dzxS-YyaRBv/YXdPNERZUDhUYVRSNmN1dkFUckFINWEwbkFHZXSZTNSznNIL21SeG56bWh5SWImLy9Gb1Jjd1FTMjZOYndSVEhxVFMVMktkV09sZEI5amI2NGdRd3phYm4wazdBS1RlaE5RcFNJNUcyNXM9S0/>

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### SCIAM NEWS – Bird Brains Are Far More Humanlike Than Once Thought

The avian cortex had been hiding in plain sight all along. Humans were just too birdbrained to see it

<http://links.email.scientificamerican.com/els/v1/rZp0hYA0qGTW-/YXdPNERZUDhUYVRSNmN1dkFUckFINWEwbkFHZXSZTNSznNIL21SeG56bWh5SWImLy9Gb1Jjd1FTMjZOYndSVEhxVFMVMktkV09sZEI5amI2NGdRd3phYm4wazdBS1RlaE5RcFNJNUcyNXM9S0/>

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### SCIAM NEWS – Conservative and Liberal Brains Might Have Some Real Differences

Scanners try to watch the red-blue divide play out underneath the skull

[https://www.scientificamerican.com/article/conservative-and-liberal-brains-might-have-some-real-differences/?utm\\_source=promotion&utm\\_medium=email&utm\\_campaign=december-mind-alert&utm\\_content=article&utm\\_term=MINDSI-20210101\\_CVP\\_v1\\_s1&spMailingID=69374304&spUserID=NTY1MTgzOTY4MAS2&spJobID=2022380714&spReportId=MjAyMjM0MDcxNAS2](https://www.scientificamerican.com/article/conservative-and-liberal-brains-might-have-some-real-differences/?utm_source=promotion&utm_medium=email&utm_campaign=december-mind-alert&utm_content=article&utm_term=MINDSI-20210101_CVP_v1_s1&spMailingID=69374304&spUserID=NTY1MTgzOTY4MAS2&spJobID=2022380714&spReportId=MjAyMjM0MDcxNAS2)

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## SCIENCE DAILY – The DNA regions in our brain that contribute to make us human

With only 1 percent difference, the human and chimpanzee protein-coding genomes are remarkably similar. Understanding the biological features that make us human is part of a fascinating and intensely debated line of research. Researchers have developed a new approach to pinpoint adaptive human-specific changes in the way genes are regulated in the brain.

<https://www.sciencedaily.com/releases/2020/12/201216085039.htm>

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## SCIENCE DAILY – What's up, Skip? Kangaroos really can 'talk' to us, study finds

Animals that have never been domesticated, such as kangaroos, can intentionally communicate with humans, challenging the notion that this behavior is usually restricted to domesticated animals like dogs, horses or goats, a new study has found.

<https://www.sciencedaily.com/releases/2020/12/201217135258.htm>

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## SCIENCE DAILY – Monkeys, like humans, persist at tasks they've already invested in

Humans are generally reluctant to give up on something they've already committed time and effort to. It's called the 'sunk costs' phenomenon, where the more resources we sink into an endeavor, the likelier we are to continue -- even if we sense it's futile. A new study shows that both capuchin monkeys and rhesus macaques are susceptible to the same behavior and that it occurs more often when the monkeys are uncertain about the outcome.

<https://www.sciencedaily.com/releases/2020/12/201218112531.htm>

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## SOCIETY FOR SCIENCE – Bonobos, much like humans, show commitment to completing a joint task

Experiments with bonobos suggest that humans aren't the only ones who can feel a sense of mutual responsibility toward other members of their species.

<http://click.societyforscience->

[email.com/?qs=bba8905725860a6e5cf4cec0a951a1f29de0d7be6699390a2125f33a4f382d4f6204fcaed384cc41bf480caeed7c8a1cd6aa625a37e248d6](http://click.societyforscience-email.com/?qs=bba8905725860a6e5cf4cec0a951a1f29de0d7be6699390a2125f33a4f382d4f6204fcaed384cc41bf480caeed7c8a1cd6aa625a37e248d6)

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## PUBLICATIONS

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### American Journal of Physical Anthropology

#### PAPERS

#### **JULIET K. BROPHY et al – Comparative morphometric analyses of the deciduous molars of *Homo naledi* from the Dinaledi Chamber, South Africa**

The purpose of this study is to help elucidate the taxonomic relationship between *Homo naledi* and other hominins. *Homo naledi* deciduous maxillary and mandibular molars from the Dinaledi Chamber, South Africa were compared to those of *Australopithecus africanus*, *Australopithecus afarensis*, *Paranthropus robustus*, *Paranthropus boisei*, early *Homo* sp., *Homo erectus*, early *Homo sapiens*, Upper Paleolithic *H. sapiens*, recent southern African *H. sapiens*, and Neanderthals by means of morphometric analyses of crown outlines and relative cusp areas. The crown shapes were analyzed using elliptical Fourier analyses followed by principal component analyses (PCA). The absolute and relative cusp areas were obtained in ImageJ and compared using PCA and cluster analyses.

PCA suggests that the crown shapes and relative cusp areas of mandibular molars are more diagnostic than the maxillary molars. The *H. naledi* deciduous mandibular first and second molar (dm1 and dm2) do not have a strong affinity to any taxon in the comparative sample in all analyses. While the *H. naledi* dm2 plots as an outlier in the relative cusp analysis, the *H. naledi* specimen fall closest to *Australopithecus* due to their relatively large metaconid, a primitive trait for the genus *Homo*. Although useful for differentiating Neanderthals from recent southern African *H. sapiens* and UP *H. sapiens*, the PCA of the relative cusp areas suggests that the deciduous maxillary second molars (dm2) do not differentiate other groups. The three *H. naledi* dm2 cuspal areas are variable and fall within the ranges of other *Homo*, as well as *Australopithecus*, and *Paranthropus* suggesting weak diagnostic utility.

This research provides another perspective on the morphology of, and variation within, *H. naledi*. The *H. naledi* deciduous molars do not consistently align with any genus or species in the comparative sample in either the crown shape or relative cusp analyses. This line of inquiry is consistent with other cranial and postcranial studies suggesting that *H. naledi* is unique.

<https://onlinelibrary.wiley.com/doi/full/10.1002/ajpa.24190?campaign=wolearlyview>

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### Biology Letters

#### PAPERS

#### **ALAN G. MCELLIGOTT, KRISTINE H. O'KEEFFE & ALEXANDRA C. GREEN – Kangaroos display gazing and gaze alternations during an unsolvable problem task**

Domestication is generally assumed to have resulted in enhanced communication abilities between non-primate mammals and humans, although the number of species studied is very limited (e.g. cats, *Felis catus*; dogs, *Canis familiaris*; wolves, *Canis lupus*; goats, *Capra hircus*; horses, *Equus caballus*). In species without hands for pointing, gazing at humans when dealing

with inaccessible food during an unsolvable task, and in particular gaze alternations between a human and the unsolvable task (considered forms of showing), are often interpreted as attempts at referential intentional communication. We report that kangaroos, marsupial mammals that have never been domesticated, actively gazed at an experimenter during an unsolvable problem task (10/11 kangaroos tested), thus challenging the notion that this behaviour results from domestication. Nine of the 10 kangaroos additionally showed gaze alternations between the unsolvable task and experimenter. We propose that the potential occurrence of these behaviours displayed towards humans has been underestimated, owing to a narrow focus on domestic animals, as well as a more general eutherian research bias. <https://royalsocietypublishing.org/doi/10.1098/rsbl.2020.0607>

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## Evolutionary Anthropology

### ARTICLES

#### **BERNARD WOOD – Birth of *Homo erectus***

Eugène Dubois was the pioneer of human origins research in South-East Asia, specifically on two of the islands, Sumatra and Java, now included in Indonesia. Dubois was a polymath, whose research interests embraced encephalization and hydrology as well as paleoanthropology. His interpretations of the hominin fossil evidence he collected, which he eventually assigned to *Pithecanthropus erectus*, changed over the years, and he evidently felt defensive about those interpretations, but in his 1894 paper he presents cogent reasons for his decision. The taxon he introduced is still recognized, and while it is no longer seen as “the” link between fossil apes and modern humans, it is currently one of the longest surviving hominin taxa. <https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21873?campaign=woletoc>

### PAPERS

#### **MICHELLE C. LANGLEY & THOMAS SUDDENDORF – Mobile containers in human cognitive evolution studies: Understudied and underrepresented**

Mobile carrying devices—slings, bags, boxes, containers, etc.—are a ubiquitous tool form among recent human communities. So ingrained are they to our present lifeways that the fundamental relationship between mobile containers and foresight is easily overlooked, resulting in their significance in the study of human cognitive development being largely unrecognized. Exactly when this game-changing innovation appeared and became an essential component of the human toolkit is currently unknown. Taphonomic processes are obviously a significant factor in this situation; however, we argue that these devices have also not received the attention that they deserve from human evolution researchers. Here we discuss what the current archeological evidence is for Pleistocene-aged mobile containers and outline the various lines of evidence that they provide for the origins and development of human cognitive and cultural behavior. <https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21857?campaign=woletoc>

#### **METIN I. EREN, STEPHEN J. LYCETT & MASAKI TOMONAGA – Underestimating Kanzi? Exploring Kanzi-Oldowan comparisons in light of recent human stone tool replication**

The knapping experiments with Kanzi, a bonobo, are among the most insightful experiments into Oldowan technology ever undertaken. Comparison of his artifacts against archeological material, however, indicated he did not produce Oldowan lithic attributes precisely, prompting suggestions that this indicated cognitive or biomechanical impediments. The literature describing the learning environment provided to Kanzi, we suggest, indicates alternative factors. Based on consideration of wild chimpanzee learning environments, and experiments with modern knappers that have looked at learning environment, we contend that Kanzi's performance was impeded by an impoverished learning environment compared to those experienced by novice Oldowan knappers. Such issues are precisely those that might be tested via a repeat study, but in this case, practical and ethical constraints likely impede this possibility. We propose experiments that may be relevant to drawing conclusions from Kanzi's experiments that may not need to use non-human primates, thus bypassing some of these issues. <https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21858?campaign=woletoc>

#### **ABIGAIL E. PAGE & JENNIFER C. FRENCH – Reconstructing prehistoric demography: What role for extant hunter-gatherers?**

Demography is central to biological, behavioral, and cultural evolution. Knowledge of the demography of prehistoric populations of both *Homo sapiens* and earlier members of the genus *Homo* is, therefore, key to the study of human evolution. Unfortunately, demographic processes (fertility, mortality, migration) leave little mark on the archeological and paleoanthropological records. One common solution to this issue is the application of demographic data from extant hunter-gatherers to prehistory. With the aim of strengthening this line of enquiry, here we outline some pitfalls and their interpretative implications. In doing so, we provide recommendations about the application of hunter-gatherer data to the study of demographic trends throughout human evolution. We use published demographic data from extant hunter-gatherers to show that it is the diversity seen among extant hunter-gatherers—both intra- and inter-population variability—that is most relevant and useful for understanding past hunter-gatherer demography. <https://onlinelibrary.wiley.com/doi/full/10.1002/evan.21869?campaign=woletoc>

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## Nature

### PAPERS

#### **ALAN S. COWEN et al – Sixteen facial expressions occur in similar contexts worldwide**

Understanding the degree to which human facial expressions co-vary with specific social contexts across cultures is central to the theory that emotions enable adaptive responses to important challenges and opportunities. Concrete evidence linking social context to specific facial expressions is sparse and is largely based on survey-based approaches, which are often constrained by language and small sample sizes. Here, by applying machine-learning methods to real-world, dynamic behaviour, we ascertain whether naturalistic social contexts (for example, weddings or sporting competitions) are associated with specific facial expressions<sup>14</sup> across different cultures. In two experiments using deep neural networks, we examined the extent to which 16 types of facial expression occurred systematically in thousands of contexts in 6 million videos from 144 countries. We found that each kind of facial expression had distinct associations with a set of contexts that were 70% preserved across 12 world regions. Consistent with these associations, regions varied in how frequently different facial expressions were produced as a function of which contexts were most salient. Our results reveal fine-grained patterns in human facial expressions that are preserved across the modern world.

<https://www.nature.com/articles/s41586-020-3037-7>

#### **SÉBASTIEN BALLESTA et al – Values encoded in orbitofrontal cortex are causally related to economic choices**

In the eighteenth century, Daniel Bernoulli, Adam Smith and Jeremy Bentham proposed that economic choices rely on the computation and comparison of subjective values. This hypothesis continues to inform modern economic theory and research in behavioural economics, but behavioural measures are ultimately not sufficient to verify the proposal. Consistent with the hypothesis, when agents make choices, neurons in the orbitofrontal cortex (OFC) encode the subjective value of offered and chosen goods. Value-encoding cells integrate multiple dimensions, variability in the activity of each cell group correlates with variability in choices and the population dynamics suggests the formation of a decision. However, it is unclear whether these neural processes are causally related to choices. More generally, the evidence linking economic choices to value signals in the brain remains correlational. Here we show that neuronal activity in the OFC is causal to economic choices. We conducted two experiments using electrical stimulation in rhesus monkeys (*Macaca mulatta*). Low-current stimulation increased the subjective value of individual offers and thus predictably biased choices. Conversely, high-current stimulation disrupted both the computation and the comparison of subjective values, and thus increased choice variability. These results demonstrate a causal chain linking subjective values encoded in OFC to valuation and choice.

<https://www.nature.com/articles/s41586-020-2880-x>

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## Nature Communications

### PAPERS

#### **R. NATHAN SPRENG et al with ROBIN I. M. DUNBAR – The default network of the human brain is associated with perceived social isolation**

Humans survive and thrive through social exchange. Yet, social dependency also comes at a cost. Perceived social isolation, or loneliness, affects physical and mental health, cognitive performance, overall life expectancy, and increases vulnerability to Alzheimer's disease-related dementias. Despite severe consequences on behavior and health, the neural basis of loneliness remains elusive. Using the UK Biobank population imaging-genetics cohort ( $n = \sim 40,000$ , aged 40–69 years when recruited, mean age = 54.9), we test for signatures of loneliness in grey matter morphology, intrinsic functional coupling, and fiber tract microstructure. The loneliness-linked neurobiological profiles converge on a collection of brain regions known as the 'default network'. This higher associative network shows more consistent loneliness associations in grey matter volume than other cortical brain networks. Lonely individuals display stronger functional communication in the default network, and greater microstructural integrity of its fornix pathway. The findings fit with the possibility that the up-regulation of these neural circuits supports mentalizing, reminiscence and imagination to fill the social void.

<https://www.nature.com/articles/s41467-020-20039-w>

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## Nature Human Behaviour

### PAPERS

#### **BETHANY BURUM, MARTIN A. NOWAK & MOSHE HOFFMAN – An evolutionary explanation for ineffective altruism**

We donate billions to charities each year, yet much of our giving is ineffective. Why are we motivated to give but not to give effectively? Building on evolutionary game theory, we argue that donors evolved (genetically or culturally) to be insensitive to efficacy because people tend not to reward efficacy, as social rewards tend to depend on well-defined and highly observable behaviours. We present five experiments testing key predictions of this account that are difficult to reconcile with alternative accounts based on cognitive or emotional limitations. Namely, we show that donors are more sensitive to efficacy when helping (1) themselves or (2) their families. Moreover, (3) social rewarders don't condition on efficacy or other difficult-to-observe behaviours (4, 5), such as the amount donated.

<https://www.nature.com/articles/s41562-020-00950-4>

**AURÉLIEN MOUNIER et al – Gravettian cranial morphology and human group affinities during the European Upper Palaeolithic**

Archaeologically defined Upper Palaeolithic (UP, 45,000–10,000 years ago) “cultures” are often used as proxies to designate fossil populations. While recent genomic studies have partly clarified the complex relationship between European UP “cultures” and past population dynamics, they leave open numerous questions regarding the biological characterization of these human groups, especially regarding the Mid-UP period (MUP, 33,000–24,000 years ago), which encompasses a pan-European cultural mosaic (Gravettian) with several regional facies. Here, we analyse a large database of well-dated and well-preserved UP crania, including MUP specimens from South-West France (SWF) and Moravia, using 3D geometric morphometrics to test for human group affinities. Our results show that the Gravettian makers from these two regions form a remarkably phenetically homogeneous sample which is different from, and more homogeneous than, the Late UP sample. Those results are congruent with genomic studies indicating a genetic continuity within the Gravettian manufacturers and a discontinuity marked by the Last Glacial Maximum (LGM). Moreover, our study expands the geographical range of the MUP phenetic continuity to SWF, for which aDNA data are scarce, and clarifies the post-LGM European population structure in SWF, with a possible dual ancestry stemming from different LGM refugia.

<https://www.nature.com/articles/s41598-020-78841-x>

**SIMONE PIKA et al – Ravens parallel great apes in physical and social cognitive skills**

Human children show unique cognitive skills for dealing with the social world but their cognitive performance is paralleled by great apes in many tasks dealing with the physical world. Recent studies suggested that members of a songbird family—corvids—also evolved complex cognitive skills but a detailed understanding of the full scope of their cognition was, until now, not existent. Furthermore, relatively little is known about their cognitive development. Here, we conducted the first systematic, quantitative large-scale assessment of physical and social cognitive performance of common ravens with a special focus on development. To do so, we fine-tuned one of the most comprehensive experimental test-batteries, the Primate Cognition Test Battery (PCTB), to raven features enabling also a direct, quantitative comparison with the cognitive performance of two great ape species. Full-blown cognitive skills were already present at the age of four months with subadult ravens’ cognitive performance appearing very similar to that of adult apes in tasks of physical (quantities, and causality) and social cognition (social learning, communication, and theory of mind). These unprecedented findings strengthen recent assessments of ravens’ general intelligence, and aid to the growing evidence that the lack of a specific cortical architecture does not hinder advanced cognitive skills. Difficulties in certain cognitive scales further emphasize the quest to develop comparative test batteries that tap into true species rather than human specific cognitive skills, and suggest that socialization of test individuals may play a crucial role. We conclude to pay more attention to the impact of personality on cognitive output, and a currently neglected topic in Animal Cognition—the linkage between ontogeny and cognitive performance.

<https://www.nature.com/articles/s41598-020-77060-8>

**EVY VAN BERLO et al – Experimental evidence for yawn contagion in orangutans (*Pongo pygmaeus*)**

Yawning is highly contagious, yet both its proximate mechanism(s) and its ultimate causation remain poorly understood. Scholars have suggested a link between contagious yawning (CY) and sociality due to its appearance in mostly social species. Nevertheless, as findings are inconsistent, CY’s function and evolution remains heavily debated. One way to understand the evolution of CY is by studying it in hominids. Although CY has been found in chimpanzees and bonobos, but is absent in gorillas, data on orangutans are missing despite them being the least social hominid. Orangutans are thus interesting for understanding CY’s phylogeny. Here, we experimentally tested whether orangutans yawn contagiously in response to videos of conspecifics yawning. Furthermore, we investigated whether CY was affected by familiarity with the yawning individual (i.e. a familiar or unfamiliar conspecific and a 3D orangutan avatar). In 700 trials across 8 individuals, we found that orangutans are more likely to yawn in response to yawn videos compared to control videos of conspecifics, but not to yawn videos of the avatar. Interestingly, CY occurred regardless of whether a conspecific was familiar or unfamiliar. We conclude that CY was likely already present in the last common ancestor of humans and great apes, though more converging evidence is needed.

<https://www.nature.com/articles/s41598-020-79160-x>

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**Philosophical Transactions of the Royal Society B**

*Theme issue ‘Offline perception: voluntary and spontaneous perceptual experiences without matching external stimulation’.*

**PAPERS****FLAVIE WATERS, JOSEPH M. BARNBY & JAN DIRK BLOM – Hallucination, imagery, dreaming: reassembling stimulus-independent perceptions based on Edmund Parish’s classic misperception framework**

Within the broad field of human perception lies the category of stimulus-independent perceptions, which draws together experiences such as hallucinations, mental imagery and dreams. Traditional divisions between medical and psychological

sciences have contributed to these experiences being investigated separately. This review aims to examine their similarities and differences at the levels of phenomenology and underlying brain function and thus reassemble them within a common framework. Using Edmund Parish's historical work as a guiding tool and the latest research findings in the cognitive, clinical and computational sciences, we consider how different perspectives may be reconciled and help generate novel hypotheses for future research.

<https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2019.0701>

### **ROGER KOENIG-ROBERT & JOEL PEARSON – Why do imagery and perception look and feel so different?**

Despite the past few decades of research providing convincing evidence of the similarities in function and neural mechanisms between imagery and perception, for most of us, the experience of the two are undeniably different, why? Here, we review and discuss the differences between imagery and perception and the possible underlying causes of these differences, from function to neural mechanisms. Specifically, we discuss the directional flow of information (top-down versus bottom-up), the differences in targeted cortical layers in primary visual cortex and possible different neural mechanisms of modulation versus excitation. For the first time in history, neuroscience is beginning to shed light on this long-held mystery of why imagery and perception look and feel so different.

<https://royalsocietypublishing.org/doi/abs/10.1098/rstb.2019.0703>

### **BENCE NANAY – Unconscious mental imagery**

Historically, mental imagery has been defined as an experiential state—as something necessarily conscious. But most behavioural or neuroimaging experiments on mental imagery—including the most famous ones—do not actually take the conscious experience of the subject into consideration. Further, recent research highlights that there are very few behavioural or neural differences between conscious and unconscious mental imagery. I argue that treating mental imagery as not necessarily conscious (as potentially unconscious) would bring much needed explanatory unification to mental imagery research. It would also help us to reassess some of the recent aphantasia findings inasmuch as at least some subjects with aphantasia would be best described as having unconscious mental imagery.

<https://royalsocietypublishing.org/doi/full/10.1098/rstb.2019.0689>

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## **PLoS Biology**

### **PAPERS**

#### **ANIS NAJAR et al – The actions of others act as a pseudo-reward to drive imitation in the context of social reinforcement learning**

While there is no doubt that social signals affect human reinforcement learning, there is still no consensus about how this process is computationally implemented. To address this issue, we compared three psychologically plausible hypotheses about the algorithmic implementation of imitation in reinforcement learning. The first hypothesis, decision biasing (DB), postulates that imitation consists in transiently biasing the learner's action selection without affecting their value function. According to the second hypothesis, model-based imitation (MB), the learner infers the demonstrator's value function through inverse reinforcement learning and uses it to bias action selection. Finally, according to the third hypothesis, value shaping (VS), the demonstrator's actions directly affect the learner's value function. We tested these three hypotheses in 2 experiments (N = 24 and N = 44) featuring a new variant of a social reinforcement learning task. We show through model comparison and model simulation that VS provides the best explanation of learner's behavior. Results replicated in a third independent experiment featuring a larger cohort and a different design (N = 302). In our experiments, we also manipulated the quality of the demonstrators' choices and found that learners were able to adapt their imitation rate, so that only skilled demonstrators were imitated. We proposed and tested an efficient meta-learning process to account for this effect, where imitation is regulated by the agreement between the learner and the demonstrator. In sum, our findings provide new insights and perspectives on the computational mechanisms underlying adaptive imitation in human reinforcement learning.

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3001028>

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## **PLoS One**

### **PAPERS**

#### **TABEA MEIER et al with JAMES W. PENNEBAKER – Stereotyping in the digital age: Male language is “ingenious”, female language is “beautiful” – and popular**

The huge power for social influence of digital media may come with the risk of intensifying common societal biases, such as gender and age stereotypes. Speaker's gender and age also behaviorally manifest in language use, and language may be a powerful tool to shape impact. The present study took the example of TED, a highly successful knowledge dissemination platform, to study online influence. Our goal was to investigate how gender- and age-linked language styles—beyond chronological age and identified gender—link to talk impact and whether this reflects gender and age stereotypes. In a pre-registered study, we collected transcripts of TED Talks along with their impact measures, i.e., views and ratios of positive and negative talk ratings, from the TED website. We scored TED Speakers' (N = 1,095) language with gender- and age-morphed language metrics to obtain measures of female versus male, and younger versus more senior language styles. Contrary to our expectations and to the literature on gender stereotypes, more female language was linked to higher impact in terms of



quantity, i.e., more talk views, and this was particularly the case among talks with a lot of views. Regarding quality of impact, language signatures of gender and age predicted different types of positive and negative ratings above and beyond main effects of speaker's gender and age. The differences in ratings seem to reflect common stereotype contents of warmth (e.g., "beautiful" for female, "courageous" for female and senior language) versus competence (e.g., "ingenious", "informative" for male language). The results shed light on how verbal behavior may contribute to stereotypical evaluations. They also illuminate how, within new digital social contexts, female language might be uniquely rewarded and, thereby, an underappreciated but highly effective tool for social influence.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0243637>

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## PNAS

### PAPERS

#### **SEOUNG-MOK YUM et al – Fingerprint ridges allow primates to regulate grip**

Fingerprints are unique to primates and koalas but what advantages do these features of our hands and feet provide us compared with the smooth pads of carnivorans, e.g., feline or ursine species? It has been argued that the epidermal ridges on finger pads decrease friction when in contact with smooth surfaces, promote interlocking with rough surfaces, channel excess water, prevent blistering, and enhance tactile sensitivity. Here, we found that they were at the origin of a moisture-regulating mechanism, which ensures an optimal hydration of the keratin layer of the skin for maximizing the friction and reducing the probability of catastrophic slip due to the hydrodynamic formation of a fluid layer. When in contact with impermeable surfaces, the occlusion of the sweat from the pores in the ridges promotes plasticization of the skin, dramatically increasing friction. Occlusion and external moisture could cause an excess of water that would defeat the natural hydration balance. However, we have demonstrated using femtosecond laser-based polarization-tunable terahertz wave spectroscopic imaging and infrared optical coherence tomography that the moisture regulation may be explained by a combination of a microfluidic capillary evaporation mechanism and a sweat pore blocking mechanism. This results in maintaining an optimal amount of moisture in the furrows that maximizes the friction irrespective of whether a finger pad is initially wet or dry. Thus, abundant low-flow sweat glands and epidermal furrows have provided primates with the evolutionary advantage in dry and wet conditions of manipulative and locomotive abilities not available to other animals.

<https://www.pnas.org/content/117/50/31665.abstract?etoc>

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## Trends in Cognitive Sciences

### PAPERS

#### **DAVID PITCHER & LESLIE G. UNGERLEIDER – Evidence for a Third Visual Pathway Specialized for Social Perception**

Existing models propose that primate visual cortex is divided into two functionally distinct pathways. The ventral pathway computes the identity of an object; the dorsal pathway computes the location of an object, and the actions related to that object. Despite remaining influential, the two visual pathways model requires revision. Both human and non-human primate studies reveal the existence of a third visual pathway on the lateral brain surface. This third pathway projects from early visual cortex, via motion-selective areas, into the superior temporal sulcus (STS). Studies demonstrating that the STS computes the actions of moving faces and bodies (e.g., expressions, eye-gaze, audio-visual integration, intention, and mood) show that the third visual pathway is specialized for the dynamic aspects of social perception.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(20\)30278-3?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30278-3?dgcid=raven_jbs_aip_email)

#### **MEDHA SHEKHAR & DOBROMIR RAHNEV – Sources of Metacognitive Inefficiency**

Confidence judgments are typically less informative about one's accuracy than they could be; a phenomenon we call metacognitive inefficiency. We review the existence of different sources of metacognitive inefficiency and classify them into four categories based on whether the corruption is due to: (i) systematic or nonsystematic influences, and (ii) the input to or the computation of the metacognitive system. Critically, the existence of different sources of metacognitive inefficiency provides an alternative explanation for behavioral findings typically interpreted as evidence for domain-specific (and against domain-general) metacognitive systems. We argue that, contrary to the dominant assumption in the field, metacognitive failures are not monolithic and suggest that understanding the sources of metacognitive inefficiency should be a primary goal of the science of metacognition.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(20\)30253-9?dgcid=raven\\_jbs\\_etoc\\_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30253-9?dgcid=raven_jbs_etoc_email)

#### **BRUCE RAWLINGS & CRISTINE H. LEGARE – Toddlers, Tools, and Tech: The Cognitive Ontogenesis of Innovation**

The development of tool innovation presents a paradox. How do humans have such diverse and complex technology, ranging from smartphones to aircraft, and yet young children find even simple tool innovation challenges, such as fashioning a hook to retrieve a basket from a tube, remarkably difficult? We propose that the solution to this paradox is the cognitive ontogenesis of tool innovation. Using a common measure of children's tool innovation, we describe how multiple cognitive mechanisms work in concert at each step of its process: recognizing the problem, generating appropriate solutions, and the social transmission of innovations. We discuss what the ontogeny of this skill tells us about cognitive and cultural evolution and provide recommendations for future research.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(20\)30252-7?dgcid=raven\\_jbs\\_etoc\\_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30252-7?dgcid=raven_jbs_etoc_email)

### **ASIFA MAJID – Human Olfaction at the Intersection of Language, Culture, and Biology**

The human sense of smell can accomplish astonishing feats, yet there remains a prevailing belief that olfactory language is deficient. Numerous studies with English speakers support this view: there are few terms for odors, odor talk is infrequent, and naming odors is difficult. However, this is not true across the world. Many languages have sizeable smell lexicons — smell is even grammaticalized. In addition, for some cultures smell talk is more frequent and odor naming easier. This linguistic variation is as yet unexplained but could be the result of ecological, cultural, or genetic factors or a combination thereof. Different ways of talking about smells may shape aspects of olfactory cognition too. Critically, this variation sheds new light on this important sensory modality.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(20\)30277-1?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30277-1?dgcid=raven_jbs_aip_email)

### **ALAN S. COWEN & DACHER KELTNER – Semantic Space Theory: A Computational Approach to Emotion**

Within affective science, the central line of inquiry, animated by basic emotion theory and constructivist accounts, has been the search for one-to-one mappings between six emotions and their subjective experiences, prototypical expressions, and underlying brain states. We offer an alternative perspective: semantic space theory. This computational approach uses wide-ranging naturalistic stimuli and open-ended statistical techniques to capture systematic variation in emotion-related behaviors. Upwards of 25 distinct varieties of emotional experience have distinct profiles of associated antecedents and expressions. These emotions are high-dimensional, categorical, and often blended. This approach also reveals that specific emotions, more than valence, organize emotional experience, expression, and neural processing. Overall, moving beyond traditional models to study broader semantic spaces of emotion can enrich our understanding of human experience.

[https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613\(20\)30276-X?dgcid=raven\\_jbs\\_aip\\_email](https://www.cell.com/trends/cognitive-sciences/fulltext/S1364-6613(20)30276-X?dgcid=raven_jbs_aip_email)

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